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DANGEROUS TRADES.

Dangerous Trades: the Historical, Social, and Legal Aspects of Industrial Occupations as affecting Health. By a number of Experts. Edited by Thomas Oliver, M.D. (London: John Murray, 1902.)

IT is claimed for this volume of some 900 closely printed pages that it constitutes the first serious attempt in this or indeed any other country to deal comprehensively with the conduct of trades in relation to the life and health of the workers. And there is a certain fitness in the fact that such a book should first be produced here and that its authors should be British, inasmuch as Great Britain has led the van in factory legislation as she has hitherto led it in industrial enterprise. Industrial enterprise and the economic and social amelioration of the worker inevitably go together, for in proportion as each country advances in commercial prosperity and in economic development, higher ideals of comfort and higher standards of industrial hygiene are demanded by its people. Our own legislative attempts to secure these began with the opening years of the last century, and have been made the basis of, and the occasion for, similar attempts abroad. The general result has been that during the last forty or fifty years the lot of the artisan has been everywhere brightened by the improvement of the conditions under which much of his labour has to be performed.

It is hardly necessary to say that such a measure of progress has only been obtained by strenuous and persistent effort, by outside interference, or in other words, by the working of the public conscience and the force of public opinion.

Apathy, callousness, self-interest and an obstinate adherence to the doctrines of a perverted political economy have too frequently stood in the way of well-recognised reforms. It must be admitted that much of the improvement has been contemporaneous with the shifting of political power, but whether as the direct result of it is by no means equally certain. The spread of information, a more enlightened self-interest on the part of the worker, the organisation of labour, a deeper and more active sense of public responsibility in regard to unhealthy trades, together with an intelligent appreciation on the part of employers that what is good for the bee is also good for the bee-hive, have combined to secure the good which has been achieved.

The book before us is made up of sixty chapters—so many separate essays, in fact—contributed by thirty-eight authors, all of whom must be considered specialists on the subjects with which they deal.

It is impossible within the space at our disposal to do more than indicate in the briefest possible way the main features of the mass of material which Dr. Oliver and his coadjutors have brought together. We hope, however, to succeed in showing that the work deserves the careful attention of everyone interested in the hygiene of industrial life—employers of labour, factory inspectors, certifying surgeons, and also of the many members of our Legislature who concern themselves with the well-being of our artisan population. It is not to be expected that all will give unqualified assent to every expression of opinion to be found within the work. The various questions of public policy which are incidentally raised are necessarily subjects of controversy, and will be viewed very differently by persons of different political proclivities or of different schools of economics. But we think that every dispassionate and impartial reader will admit that, taking it as a whole, it is a conscientious and praiseworthy attempt to deal with matters which lie at the very foundations of our industrial prosperity and happiness.

In an introductory chapter Dr. Oliver traces in a few short paragraphs the main features of the industrial revolution—the change from the domestic system of industry to the modern methods of production by machinery—which constitutes one of the most momentous epochs in the history of our civilisation, and he indicates the changes in the social and intellectual condition of the people to which it has directly and indirectly given rise. He explains how a demand for the State control of our industries so far as relates to the safety, health and moral condition of the workers has arisen, how it has been met, and within what limitations the control has been operative and effective. As regards the economic effect of factory legislation, Dr. Oliver utters no uncertain sound.

> "Those who blame State interference as the cause of the doubtful decline of our industrial supremacy, and who believe that it is checking enterprise, are not making a sufficiently serious attempt to grapple with the question by sifting all the facts carefully. It can be demonstrated that legislation has not paralysed but has improved trade as well as the conditions of labour."

He is no less reassuring as regards the results which have flowed from the Workmen's Compensation Act:—

> "The Workmen's Compensation Act," he says, "which was so strongly opposed by many employers on the supposed ground that it would ruin the industries of this country, has had apparently no effect in that direction. Although it has theoretically increased their financial liability, as a matter of fact many employers have been less out of pocket than formerly. The Act has cleared the industrial atmosphere, made employers more careful in their selection of workmen, more willing to safeguard machinery, and do all they reasonably can to prevent accidents. It pays them to do so."

Should the Act be extended so as to include a larger number of industries and more particularly those regarded as dangerous trades? On this point opinions may differ, as was shown by the fate of the proposal in Parliament to place industrial diseases on the same footing as accidents.

The main objection would seem to depend upon the difficulty of defining industrial diseases.

> "For a disease to be regarded as industrial, and capable, therefore, of being brought within the scope of the Workmen's Compensation Act, it would have to be placed upon the same narrow limit as an accident. It would require to be shown that it was the sole result of the occupation, and that there had been produced a definite pathological lesion of the body. Adopting this view, the maladies that could be included in the category would be, among others, anthrax, poisoning by lead, mercury, phosphorus, and bisulphide of carbon; but with the exception of anthrax, in which the disease is often

suddenly induced, and as rapidly runs to a fatal termination, there is not as a rule the same exactitude in the incidence of disease as is the case in accident. There might be little difficulty in including anthrax under the Act of 1897. The inclusion of some of the other dangerous trades would give rise to frequent litigation, but it would make employers more careful in the selection of their work-people, and in the means adopted to prevent industrial poisoning."

Among the most thoughtful and suggestive of the essays contained in the work are those contributed by the lady inspectors of factories. Miss Anderson's "Historical Sketch of the Development of Legislation for Injurious and Dangerous Industries in England," and her chapter on the "Regulation of Injurious or Dangerous Occupations in Factories and Workshops in Some of the Chief European Countries," are especially noteworthy for their breadth of view, thoroughness and impartiality. The one chapter, in fact, may be regarded as complementary to the other. Comparing what has been done abroad with the position at home, H.M. Principal Lady Inspector comes to the conclusion that England is lagging behind.

"England stands in a special position, with its own qualities and defects. Having entered long before most other European countries on the path of control of employment in factories owing to the earlier need of such regulation, and having admittedly also led the way in the task of building up a complete and precise sanitary code for regulation of public health, England has shown in the later stages of the part of the work which touches industry too little interest in the later efforts, on different lines, of other countries. This slowness is traceable in part to the same causes as those which have retarded in England the general study of comparative legislation and administration, of which foremost, no doubt, stands the necessity of developing on national lines our own safeguards, yet it seems probable that the country which in a singular degree stimulated European progress in public health by the justly famous "Report on the Sanitary Condition of the Labouring Population," 1838, has latterly retarded its own progress in industrial hygiene by too close an adherence to its own methods."

Again :—

"In several of these [foreign] countries, all of which had originally to some extent looked to the far earlier example and experience of England in enforcement of the law, the important step was taken, considerably in advance of England, of bringing into the factory service medical, engineering, and chemical expert knowledge. No doubt in England, the delay in this matter is directly traceable to the character stamped on the institution by the educational, moral and social origin of our Factory Acts, and to the very recent beginnings of development (1883–1891) of a special basis of factory hygiene."

In one respect, however, England compares favourably with continental nations in the completeness of its statistics in regard to industrial poisoning. As Miss Anderson points out,

"In no other country has the step been taken of laying both on the occupier of a factory or workshop and every medical practitioner the duty of reporting to a chief inspector of factories, or the central authority, individual cases of industrial poisoning.

On the other hand, in no other country is there "a power reserved to employers," similar to that which was in force in England until last year, "of compelling such objections as they can sustain to proposed rules to be settled by arbitration." What Parliament and the country thought of the manner in which arbitration had worked in the past was seen in the practical unanimity with which this form of procedure was swept away in 1901.

In a short chapter on the "Principles of Prospective Legislation for Dangerous Trades," Mr. Tennant, the chairman of the Dangerous Trades Committee, which presented its final report in 1899, deals more especially with the question of the amendment and consolidation of the law relating to factories and workshops, the history of which has this in common with that of the British constitution, that "the structure of each is compounded of small accretions, contributed by what seemed the necessity of the moment." In the present condition of the law there are unquestionably many incongruities and anomalies—exemptions difficult to justify and exceptions incapable of rational explanation. But whilst much of the practical force of Mr. Tennant's contention has been minimised by the transference, above alluded to, of the responsibility for the special rules from an arbitrator or umpire to the Secretary of State, the doubt still remains whether the main defects of the present system are altogether remedied.

Chapter v. deals with the influence of factory labour upon infant mortality, and is made up of two essays, one contributed by Mrs. Tennant, formerly H.M. Principal Lady Inspector of Factories, and the other by Dr. Reid, the Medical Officer of Health of the Staffordshire County Council. Each of these essays tells the same tale, and a sad enough story it is. We heard a good deal some little time since about "the holocaust of babes" in the concentration camps in South Africa, but the waste of infant life there was out of all comparison with that which goes on unchecked as the result of our own factory system. A former Lord Londonderry once railed against the "hypocritical humanity" of Parliament when it sought to protect the lives and limbs of coal-miners. We may hope that Parliament will not continue to turn a blind eye to the large amount of infant suffering and the terrible waste of child-life in our manufacturing towns, but will learn to recognise before it is too late that, as Sir John Simon once said, "a high local mortality of children must almost necessarily denote a high local prevalence of those causes which determine the degeneration of the race."

The exigencies of space only allow of a passing reference to Miss McMillan's essay on "Child Labour" and to that by Mr. Ballantyne on "Home Work." Happily the half-time system is dying out and the age of the full-timer is being steadily raised. The question of home or out-work is one of great difficulty, and there is much in it which calls for State regulation. But it would require a strong Minister with a strong public opinion behind him to deal with it at all adequately.

The editor contributes a short paper on the "Physiology and Pathology of Work and Fatigue," in which he treats of the means of measuring muscular work, the changes which occur in tired muscle and in the blood of fatigued persons, the effect of work on nerve structure, the use of alcohol as a muscle food, &c. Although appealing more particularly to the physiologist, the article is not too technical, and its style is appropriate to the work in which it appears. It is, perhaps, not undesirable that those who regard men and women as "hands"—that is, as machines for turning out work—should have some knowledge of the pathological consequences of fatigue.

Dr. Tatham's paper on "Mortality of Occupations" deals briefly with matters which have already been more fully treated by him and others in official publications, notably in the successive decennial supplements to the reports of the Registrar-General. In the chapter on "Dust-producing Occupations" he considers more particularly those industries which give rise to the constant inhalation of dust, leading to grave and characteristic lesions resulting in premature breakdown and death among the workers, and in a subsequent section he discusses the effects of the accumulation of respiratory and other impurities in the air breathed, partly from the neglect of suitable methods of ventilation and partly as the result of the cramped position adopted in certain cases of sedentary indoor labour.

Dr. Oliver also contributes a chapter on "Dust as a Cause of Occupation Disease," with special reference to the skin diseases of flax-workers and the diseases of the nails among furriers, lung diseases, and gastro-intestinal lesions attributable to dust.

The chapter on "Dustwomen" is curious and interesting, and serves to show how the dangers due to what is a disagreeable and at times even a disgusting employment may be mitigated by the conditions under which the work is performed if only a little common sense and prudence are exercised.

By far the greater portion of the work is concerned with the effect of particular industries upon the health or longevity of the worker, and it is this section which will appeal most strongly to individual employers, to statisticians and to the practical legislator. Mr. Cunynghame contributes an interesting article on the history of the attempts which have been made by the Board of Trade and by Parliament to bring the dangerous operations on railways under regulations analogous to those which can be made by the Home Office in regard to the dangerous processes in factories and mines. Although time can alone show how far Mr. Ritchie's attempt to bring railway labour within the circle of protected industries will actually realise the anticipations held out at the time of the passing of his Act, there can be no question that the position of railway servants as regards immunity from accidents has been thereby greatly ameliorated.

The extraordinary development of the technical applications of electricity has brought a special crop of dangers to the workers in its train, which are dealt with by Commander Hamilton Smith, who also contributes a chapter on acetylene and its dangers.

Lead and its compounds are naturally dealt with by the editor, who also treats of china and earthenware manufacture and of phosphorus and lucifer matches—subjects with which he has specially concerned himself at the instance of the Home Office. Mr. Malcolm Morris furnishes a short chapter on the industrial employment of arsenic; Dr. Legge contributes one on the dangers in the use of mercury and its salts, and one on the lesions resulting from the manufacture and uses of the alkaline bichromates. The effects of the dust of basic slag, and that resulting from ganister crushing and from buhrstone chiselling, are also treated in special chapters. Steel grinding is dealt with by Mr. Sinclair White, who, as a lecturer connected with the medical department of University College, Sheffield, has special opportunities of acquiring information; and the subject of "brass ague," which is particularly prevalent in Birmingham, the home of the brass trade, is treated by Dr. Simon, of the General Hospital in that city.

The dangers incidental to the use of bisulphide of carbon and naphtha in the manufacture of indiarubber and of benzene in dry cleaning are considered by the editor, who in this connection might also have had regard to the use of carbon bisulphide as a wool cleansing or degreasing agent. Dr. Prosser White, who is officially connected with the Roburite Explosives Company, contributes a chapter on the effects of dinitrobenzene and other nitro-substitution products on the workmen employed in the manufacture of high explosives. The effects of such explosives on the air of mines, together with the general pathological results of breathing the atmosphere of mines, are considered by Dr. Haldane, who is specially well qualified by experience and observation to deal with the subject. Principal Laurie treats of the health of workers in chemical trades; Drs. Hamer and Bell furnish two essays on anthrax and its relation to the wool industry; and Mr. Stuart, who is the medical officer of health at Batley, contributes chapters on blanket stoving and on rags and their products (shoddy mungo, &c.) in relation to health. The woes of the washerwomen—and they are more grievous than many of us are aware—are sympathetically dealt with by Miss Lucy Deane; whilst Miss Paterson tears aside something of the romance which seems to environ the life of the braw fishwife "bearing with apparent ease the enormous creel of fish and her almost equally surprising burden of petticoats." We do not usually associate much that is unhealthy either with the occupation or the appearance of the stalwart lassies that make such a picturesque congregation on the quays of Stornoway, Peterhead or Lerwick. But that the "kipperer" and the "gutter" have their peculiar troubles, and that these may be avoided by definite enactment and administration, with regulated hours and sanitary work places, are equally certain.

There is much else in the book that we should have liked to indicate and many excellent features upon which we could have wished to dwell at greater length. If we have a fault to find it is that it includes too much. The diseases of soldiers at home and abroad and questions of marine sanitation hardly come within the province of a work entitled "Dangerous Trades." Admirable as the articles relating to these subjects are, we think the editor would have been well advised to keep to subjects which are strictly within the purview of the Home Office. No doubt it is an all-embracing Department, but if the profession of arms is to be regarded as a dangerous trade in the sense that the occupation of the potter or the wool-sorter is considered dangerous, it is not easy to see why that of the medical man, the journalist, or even the legislator should not equally have been included.

We venture to think, too, that the work suffers to some extent by the mode in which its parts have been put together. It is necessarily somewhat mosaic in character, and there is a certain want of harmony and continuity of arrangement. No doubt this is due to the difficulty of dealing with so large a body of contributors, all of whom are working independently. But these, after all, are minor blemishes, and do not seriously detract from the very great value of the compilation. We heartily congratulate Dr. Oliver and his colleagues on the production of a work which will unquestionably take high rank in the literature of sanitary reform.

T. E. Thorpe.

THE NEW INTERNATIONAL CATALOGUE.

International Catalogue of Scientific Literature. First Annual Issue. D. Chemistry, Part i. Pp. xiv + 468. (1902.) Price 21*s*.

THIS is the second instalment of the work of the International Catalogue Bureau, the first (part i. of Botany) having been reviewed in our issue of July 3 (p. 217). In a notice on p. xiv. it is explained that in consequence of the difficulties attending the complete organisation of the work of the regional bureaus some delay has arisen, and it is hoped that the second part of the volume will be published in a few months. In starting a colossal work such as this "International Catalogue," delay was inevitable, and it is to be hoped that when the different bureaus are in working order the volumes will be published more closely to the period to which they refer. On the title-page it is stated that the MS. for this volume was completed in January, 1902, so we presume that both parts i. and ii. will deal with the year 1901 only.

It is reported that although the seventeen annual volumes which constitute the "Catalogue" will, as a rule, contain the work of twelve months, yet they will not all refer to one calendar year; probably it is impossible to avoid this arrangement so as to maintain the work of the Central Bureau at a uniform rate, but it would certainly be convenient to scientific workers if, for each science, all the papers of one calendar year could be collected into one volume. No doubt the title-page of each volume will indicate the period over which the papers indexed extend, but the annual arrangement, if practicable, would appear to be much more convenient.

The authors' catalogue is contained in 111 pages with 2455 entries; in this the authors' surnames are printed in Clarendon type with the Christian names in Roman; when initials only are given in the original paper, the remainder of the name is placed in square brackets; when a paper is by more than one author, only the name of the first is in thick type. The complete title is given, usually in the language in which the paper is written. In the case of languages other than English, French, German and Italian, a translation of the title in one of these four languages follows the original; in some instances, however, translations only are given, the names of the original languages being placed in brackets. Then follow the abbreviated titles of the periodicals, with the complete reference to volume, year and pages of beginning and ending of the paper, the number of the pages being in parentheses. The registration numbers are placed in square brackets, and when the papers deal with other sciences in addition to chemistry, the letters and registration numbers of these sciences are included. The papers are numbered consecutively, these numbers concluding the entries. At the commencement of the volume, the schedule of chemistry, with registration numbers, is printed in English, French, German and Italian; and at the end there is a list of the periodicals with their full titles and the abbreviations used in the "Catalogue."

The subject catalogue occupies 283 pages, and is arranged in the order of the registration numbers. At the top of each page the registration number is given in thick type and is easily seen. Each division is marked with the registration number and the corresponding subject as a heading. The numbers are here also printed in thick type and the subject in Roman capitals, but they do not catch the eye so well as could be wished; the subsidiary titles are in Clarendon with capital initials, and are more easily seen than the heading of the division; thus on p. 195 the heading "Zinc Oxide" is very visible, whereas the heading "Zinc" at the commencement of the division is not so clearly shown.

In the subject catalogue the entries are, as a rule, reprints of the corresponding entries of the authors' catalogue, commencing with the authors' names in Clarendon and, if the papers belong to more than one division, concluding with the registration numbers other than those of the division under which the entries are made. The entries are repeated under each registration number. As in a subject catalogue the authors' names are not of the first importance, it would be better, if it were possible, to give prominence to the subject. The title of a paper does not always indicate its contents, and we are glad to see that in many of the papers from English serials a title is given in square brackets which shows much more effectually the contents of the papers than the original heading; thus in the authors' catalogue occurs the following entry:—"Frankland, Percy Faraday and Farmer, Robert Crosbie. Liquid Nitrogen Peroxide as a Solvent. London, *J.* Chem. Soc., 79, 1901 (1356–1373) . . . . [0490 7100 7250]" In the subject catalogue under "0490 Nitrogen," subdivision "Nitrogen Oxides," the same entry occurs, with the registration numbers [7100 7250]. Under "7100 Mass Properties," subdivision "Molecular Weights," after the names of the authors there follows "[Molecular weight determinations in liquid nitrogen peroxide by the ebullioscopic method]," with the registration numbers [0490 7250]. Under "7250 Electrical and Magnetic Properties," subdivision "Conductivity, e find the names followed by "[Conductivity of solutions in liquid nitrogen peroxide]," with the numbers [0490 7100]. It will be seen that the last two subjects cannot be inferred from the title of the paper, and there must be many other cases of the same kind. The subject catalogue is much increased in value by this indication of the contents of the papers, for which we are indebted to the activity of the English Bureau, or perhaps more definitely to that of Mr. Ernest Goulding, the referee for this volume. It would be a great boon if the other regional bureaus could be induced to give this partial analysis of the papers. It may be replied that the fact of the reference being placed unde